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NOTICE OF ALLOWANCE AND FEE(S) DUE

23416 7590 02/22/2008

CONNOLLY BOVE LODGE & HUTZ, LLP
P O BOX 2207
WILMINGTON, DE 19899

EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1796

DATE MAILED: 02/22/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,677

06/06/2005

Jorg Schulte

09086-00226-US

6849

TITLE OF INVENTION: ORGANOMETALLIC TRANSITION METAL COMPOUND, BISCYCLOPENTADIENYL LIGAND SYSTEM, CATALYST SYSTEM AND PROCESS FOR PREPARING POLYOLEFINS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	05/22/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
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or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

23416 7590 02/22/2008

CONNOLLY BOVE LODGE & HUTZ, LLP
P O BOX 2207
WILMINGTON, DE 19899

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,677 06/06/2005 Jorg Schulte 09086-00226-US 6849

TITLE OF INVENTION: ORGANOMETALLIC TRANSITION METAL COMPOUND, BISCYCLOPENTADIENYL LIGAND SYSTEM, CATALYST SYSTEM AND PROCESS FOR PREPARING POLYOLEFINS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1440 \$300 \$0 \$1740 05/22/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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LEE, RIP A 1796 526-170000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,677	06/06/2005	Jorg Schulte	09086-00226-US	6849
23416	7590	02/22/2008	EXAMINER	
CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			LEE, RIP A	
			ART UNIT	PAPER NUMBER
			1796	
DATE MAILED: 02/22/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 193 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 193 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/537,677	SCHULTE ET AL.	
	Examiner	Art Unit	
	RIP A. LEE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to December 20, 2007.
2. ☒ The allowed claim(s) is/are 1, 2, 5-7 and 9-12.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>12-20-2007</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below, using the claims presented by Applicant on September 21, 2007. Amendments of claims 1, 9, and 10, presented in the previous office action dated September 21, 2007, remain unchanged, and they are presented again below. An amendment of claim 11 is presented. These amendments are believed to be non-substantive and relate to matters of form only.

Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Page 3

Claim 1, line 8 replace "C₂-C₂₀-alkenyl" with "C₂-C₂₀ alkenyl"

Page 5

Claim 9, line 11 replace "C₂-C₂₀-alkenyl" with "C₂-C₂₀ alkenyl"

Page 6

Claim 10, line 16 replace "C₂-C₂₀-alkenyl" with "C₂-C₂₀ alkenyl"

Page 7

Claim 11, line 1 replace "further comprise" with "which further comprises"

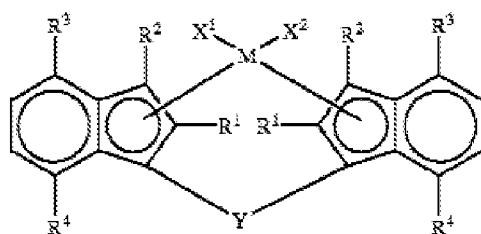
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Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1, 2, 5-7, and 9-12 are allowed over the closest references cited below.

The present invention is drawn to an organometallic compound of formula (I); see claims for full details. Salient features of the compound include: R^2 is a (un)substituted C_6 - C_{40} aryl radical, R^5 is a C_1 - C_{20} alkyl radical, a C_2 - C_{20} alkenyl radical, or an arylalkyl radical, and Z is a divalent group CR^8R^9 - $CR^{10}R^{11}$. Another aspect of the invention is drawn to a process for preparing an organometallic transition metal compound from biscyclopentadienyl ligand system comprising a compound of formula (II). A further embodiment of the invention relates to a catalyst system comprising at least one organometallic transition metal compound (I). Another aspect of the invention is a process for preparing polyolefin in the presence of said catalyst system.

Tanaka *et al.* (U.S. 6,686,055) teaches a transition metal compound represented by formula (I) reproduced below. Substituent R^3 is a secondary or tertiary alkyl group of 3 to 20 carbon atoms or an aromatic group, R^4 is hydrogen or an alkyl group of 1-20 carbon atoms, and Y is a divalent hydrocarbon group of 1-20 carbon atoms or a divalent silicon group, *inter alia*.

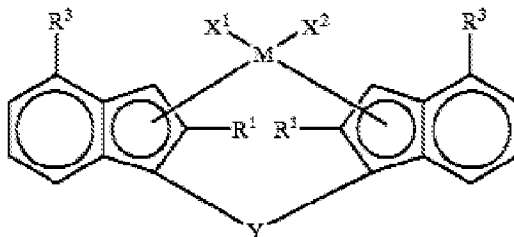


Representative compounds of formula (I) include the series, $Me_2Si(2,7-Me_2-4-alkyl-indenyl)_2ZrCl_2$ where alkyl = Et, Bu, hexyl, cyclohexyl, phenylethyl ($-CH_2CH_2Ph$), *i*-Pr, and *t*-Bu, corresponding to R^1 , R^3 , and R^4 being alkyl groups in formula (I). None of these compounds exhibits the indenyl substitution pattern recited in the instant claims (R^2 = (un)substituted C_6 - C_{40}

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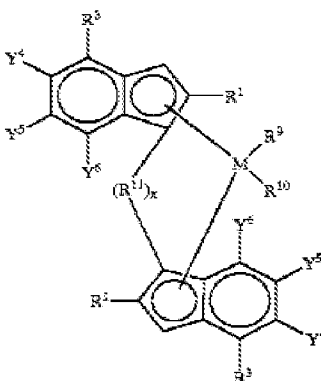
aryl group). In this series of compound, the bridging group is Me_2Si rather than a divalent group of formula $\text{CR}^8\text{R}^9\text{-CR}^{10}\text{R}^{11}$.

A subset of compounds in Tanaka *et al.* are those of general formula (Ia) represented by



$\text{Me}_2\text{Si}(2\text{-methyl-4-Ar-indenyl})_2\text{ZrCl}_2$. Note that when R^3 is an aromatic group, substituent R^4 is hydrogen. The reference does not disclose compounds containing a substituent at the 7-position of the indenyl ring when R^3 is aryl. In this series of compound, the bridging group is Me_2Si rather than a divalent group of formula $\text{CR}^8\text{R}^9\text{-CR}^{10}\text{R}^{11}$.

Bingel *et al.* (WO 98/40331; U.S. 6,492,539) teaches preparation of bisindenyl ligands for preparation of the metallocenes. The inventors present three classes of metallocene. The first is represented by formula (VI), where bridge R^{11} has $\text{R}^{12}\text{-M-R}^{13}$, where M is Si or C. This class of compound contains a bridging group with only one atom in the bridge.



Two compounds representative of this class are $\text{Me}_2\text{Si}(2,7\text{-Me}_2\text{-4-PhInd})_2\text{ZrCl}_2$ and $\text{Me}_2\text{Si}(2,7\text{-Me}_2\text{-4-naphthylInd})_2\text{ZrCl}_2$.

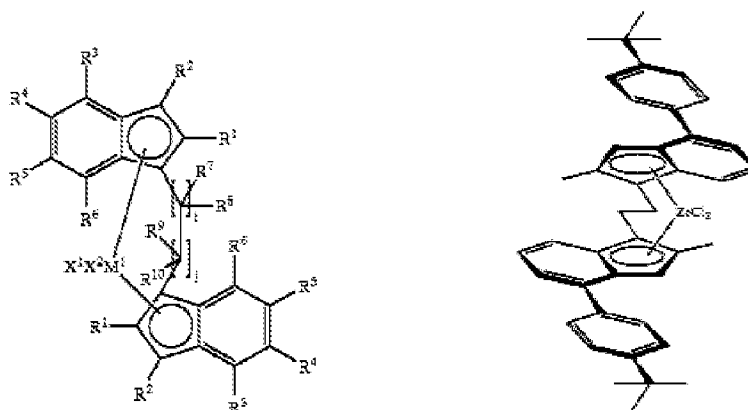
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A second class of compound are those in which R^1 is a C_6 - C_{40} linear alkyl, $Y^4 = Y^5 = Y^6 = H$, R^3 is 4-(C_4 - C_8)phenyl, and R^{11} is Me_2Si , Ph_2Si , or $Ph(Me)Si$.

The third class of compound are those in which R^1 is a C_1 - C_{10} linear alkyl, Y^4 and Y^5 are hydrogen, C_1 - C_4 alkyl, or C_6 - C_{10} aryl, Y^6 is H, R^3 is a fluorosubstituted aryl, and R^{11} is Me_2Si , or an ethylidene bridge such as CH_2CH_2 , $CH(CH_3)-CH_2$, $CH(CH_3)-CH(CH_3)$, $(CH_3)_2C-CH_2$, or $(CH_3)_2CH-CH(CH_3)_2$.

The two compounds that contain the requisite substituent in the 7-position do not contain an ethylidene bridging group, and those compounds that may contain an ethylidene bridging group lack the non-hydrogen substituent (Y^6 is H). Thus, the compounds taught in Bingel *et al.* do not meet the structural features of the claimed compound. It is the examiner's position that one having ordinary skill in the art would not have found sufficient suggestion or motivation to modify the compounds $Me_2Si(2,7-Me_2-4-PhInd)_2ZrCl_2$ or $Me_2Si(2,7-Me_2-4-naphthylInd)_2ZrCl_2$ with an ethylidene bridging group, and therefore, it would not have been obvious to one of ordinary skill in the art to make the claimed compounds based on the disclosure of Bingel *et al.*

Schulte *et al.* (WO 02/18397; U.S. 6,784,305; U.S. 2003/0199703) teaches a series alkyl-bridged metallocenes having the general structure shown below, left. Substituents R^1 to R^{10} are generically defined. Representative compounds listed in the text are metallocenes containing an ethylene bridge, an aryl group at the 4-position of the indenyl ligand and an alkyl substituent at the 2-position, shown below, right.



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Schulte *et al.* does not disclose a specific compound that exhibits the claimed structural features. One having ordinary skill in the art, having read the patent, would glean that the substantive teaching of the invention is use of a novel, sulfonyloxyalkyl precursor to form an alkylene bridge between two indenyl ligands, and that the method is especially useful for making metallocenes containing 2-alkyl-4-aryl substituted indenyl ligands. While Schulte *et al.* generically recites inclusion of various types of substituent at all ring positions, it is the examiner's position that one having ordinary skill in the art would not have found it obvious to make metallocenes having the minimum 4-/7- substitution pattern exhibited by the claimed compounds, based on the general disclosure of Schulte *et al.*

Küber *et al.* (U.S. 5,840,947) discloses the transition metal complexes 1,2-ethanediylbis(4-(2-pyridyl)-7-methylindenyl)zirconium dichloride and 1,2-ethanediylbis(2-methyl-4-(2-pyridyl)-7-methylindenyl)zirconium dichloride. The substituent at the 4-position of the indenyl ligand is a heteroaromatic group, which is not meet the structural requisite of the instant claim where R² is a (un)substituted C₆-C₄₀ aryl radical.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Examiner, Art Unit 1796

February 16, 2008